



Missouri Department of Natural Resources

Big Creek - WBID 0444

Water Chemistry data by MoDNR 2003

Org	Site Name	Yr	Mo	Dy	Time	Flow	C	DO	pH	SC	KJN	NH3N	NO3N	TP	CBOD
MoDNR	0.1 mi.above WWTP	2003	7	23	1415	0.05	27.5	12.3	8.2	508	0.8	0.01499	0.03	0.08	3.78
MoDNR	0.1 mi.above WWTP	2003	7	24	555		17.5	5.3	7.7	545	0.73	0.09	0.04	0.06	0.99
	Mean Upstream of WWTP						22.5	8.8	7.95	526.5	0.765	0.052495	0.035	0.07	2.385
MoDNR	Bethany WWTP Outfall 001	2003	7	23	1405	0.35	22	1.9	7.3	775	24.3	19	0.03	3.47	21.4
MoDNR	Bethany WWTP Outfall 001	2003	7	24	548		21	0.7	7.2	816	27	24.7	0.00499	4.19	28.8
MoDNR	Bethany WWTP Outfall 001	2003	9	3	1350	0.2	23.5	4	7.3	804	22.2	20.9	0.8	1.54	5.04
MoDNR	Bethany WWTP Outfall 001	2003	9	4	630	0.3	23	2.5	7.1	889	25.9	24.8	0.02	3.36	9.16
	Mean of WWTP Effluent						22.375	2.275	7.225	821	24.85	22.35	0.2137475	3.14	16.1
MoDNR	0.9 mi.below WWTP	2003	7	23	1345	0.4	26	8.6	8.1	749	16.1	13.4	0.22	1.67	7.84
MoDNR	0.9 mi.below WWTP	2003	7	24	615		19	1.8	7.5	729	12.1	11.2	0.2	1.49	5.94
MoDNR	0.9 mi.below WWTP	2003	9	3	1420		26.5	19.3	8.3	774	18.9	17.9	0.42	2.19	6.64
MoDNR	0.9 mi.below WWTP	2003	9	4	655		16.5	3	7.4	804	18	15.6	0.13	1.34	2.8
MoDNR	Mean 0.9 mi. below WWTP						22	8.175	7.825	764	16.275	14.525	0.2425	1.6725	5.805
	Frequency of WQ Standard Exceedence						0%	50%	0%			100%			
MoDNR	2.6 mi.below WWTP	2003	7	23	1330	0.4	26	6.7	7.7	650	3.66	1.96	1.13	0.38	2.68
MoDNR	2.6 mi.below WWTP	2003	7	24	630		20.5	2.7	7.4	648	3.26	1.83	1.47	0.33	0.99
MoDNR	2.6 mi.below WWTP	2003	9	3	1455	0	24.5	2.8	7.4	668	11	9.45	0.75	0.66	4.02
MoDNR	2.6 mi.below WWTP	2003	9	4	730	0	18.5	2.5	7.7	685	9.47	8.71	0.91	0.53	0.99
	Mean 2.6 mi. below WWTP						22.375	3.675	7.55	662.75	6.8475	5.4875	1.065	0.475	2.17
	Frequency of WQ Standard Exceedence						0%	75%	0%			100%			
MoDNR	6.0 mi.below WWTP	2003	7	24	645	0.4	18	5	7.5	519	0.81	0.01499	0.00499	0.09	0.99
MoDNR	6.0 mi.below WWTP	2003	9	3	1520		30.5	11.8	8.2	608	0.97	0.01499	0.00499	0.1	2.4
MoDNR	6.0 mi.below WWTP	2003	9	4	755	0	17	3.2	7.6	620	0.9	0.01499	0.00499	0.08	0.99
	Mean 6 mi. below WWTP						21.833	6.667	7.767	582.33	0.8933	0.01499	0.00499	0.09	1.46
	Frequency of WQ Standard Exceedence						0%	33%	0%			0%			

Water Quality Standard

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The dissolved oxygen standard for the protection of aquatic life is 5.0 mg/L as a minimum. The Listing Methodology Document allows a water to be judged as impaired if more than 10 percent of the days monitored fail to meet the water quality standard. Five of the six daily dissolved oxygen minima on Big Creek exceeded the standard. For a water with a 10 percent frequency of exceedence of a standard, five exceedences in six measurements has a binomial probability of 0.000. Since this probability is less than the minimum allowable Type One error rate of 0.1, this stream is judged to be **impaired** by low dissolved oxygen.

* The water quality standard for ammonia varies with water temperature and pH. For typical summer water temperatures and pHs, the standard ranges between 0.7-3.0 mg/L. Ammonia standards are greatly exceeded in the first mile of Big Creek below the Bethany wastewater treatment plant in July of 2003 and for more than 2.6 miles in September of 2003. Since the ammonia standard is based upon a 30 day exposure period, it can not be conclusively demonstrated from the data above that ammonia levels exceeded the standard for a continuous 30 day period. However, given that low flow periods on Big Creek can extend well beyond 30 days, it seems likely that exceedences of the chronic ammonia criteria do occur. Therefore, at least the first mile of Big Creek downstream of the Bethany wastewater treatment plant is judged to be **impaired** by ammonia.

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